

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference T03008 PCT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/DE2004/000715	International filing date (day/month/year) 02.04.2004	Priority date (day/month/year) 04.04.2003
International Patent Classification (IPC) or national classification and IPC		
Applicant T-MOBILE DEUTSCHLAND GMBH		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>20</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>9</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>	
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/DE2004/000715

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 3-17 as originally filed/furnished
- pages* 1, 2, 2a received by this Authority on 11.08.2005 with letter of 08.08.2005
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. _____ as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* 1-14 received by this Authority on 11.08.2005 with letter of 08.08.2005
- nos.* _____ received by this Authority on _____
- ☒ the drawings:
- sheets _____ as originally filed/furnished
- sheets* 1/3-3/3 received by this Authority on 11.08.2005 with letter of 08.08.2005
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☒ the claims, nos. 2, 4, 6-10, 12-14
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. IV Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has:
- ☐ restricted the claims.
 - ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☐ neither restricted the claims nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
 - ☒ not complied with for the following reasons:

See supplemental sheets.

4. Consequently, this report has been established in respect of the following parts of the international application:

☒ all parts.

☐ the parts relating to claims Nos. _____

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/DE2004/000715

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1, 3, 5-8	YES
	Claims	2, 4	NO
Inventive step (IS)	Claims		YES
	Claims	1-8	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
1. This report makes reference to the following documents, D1-D3:			
D1: WO-A-01/45284			
D2: DE-A-43 02 228			
D3: "Radio network planning process and methods for WCDMA"			
Laiho Jaana, Wacker Achim			
Annales des Télécommunications, no. 56, 2001			
Presses polytechniques et universitaires romandes, Lausanne, CH			
pages 317-331			
A. Certain observations on the international application			
Clarity, PCT Article 6			
1. For the following reasons, present claims 2, 4, 9 and 10 do not meet the requirement of PCT Article 6 with respect to clarity:			

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Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

1.1 Claims 2, 4, 9 and 10 attempt to define the "development of an assertion about the coverage situation (claim 9) or about the radio coverage (claims 2, 4, and 10; see Box I, 1.3 above) in the uplink and downlink":

It has been noted that the terms "coverage situation" and "radio coverage" in this context are regarded as vague and unclear, since they do not appear to have a generally recognized meaning. The terms "coverage situation" and "radio coverage" could indicate, for example, whether the UL/DL has sufficient signal levels or, for example, whether the UL/DL has sufficient capacity.

1.2 Even if the terms "coverage situation" and "radio coverage" were accepted as being clear, it is not sufficiently clear from the present definition in claims 2, 4, 9 and 10 how an assertion about the "coverage situation" or "radio coverage" in the UL/DL is actually determined using the measured data for the received power of the DL pilot, the measured data for the interference strength, or the received power of the continuously transmitting pilot channels, i.e. it is not clear which method steps are actually carried out.

1.3 If the description is taken into consideration, the following appears to be

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citations and explanations supporting such statement

relevant:

- (a) The received power of the primary common pilot channel (pCPICH) is determined (" E_c "); this value " E_c " is included in equation (1) for the UL and in equation (5) for the DL;
- (b) the value " $(E_b/N_o)_{\text{target}}$ " is determined (see equations (3) and (6)); in order to do so, " I_{eig} " and " I_{fr} " have to be determined (see pages 11-13);
- (c) in order for the above to take place, the continuously transmitting DL common control channels have to be taken into consideration; the " $(E_b/N_o)_{\text{target}}$ " value is established based on the measured values for the pilot channel.

The description is contradictory because on pages 11-15, it appears that only the " $(E_b/N_o)_{\text{target}}$ " value is determined for the downlink, and it remains unclear whether there is also provision for the analogous determination of the " $(E_b/N_o)_{\text{target}}$ " value for the uplink. Therefore, it is not clear whether a coverage assertion for the uplink can be determined at all using the method according to the invention.

- 1.4 None of **claims 2, 4, 9 and 10** contains a clear definition of the method set out in the description:

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citations and explanations supporting such statement

In **claims 2 and 9**, only the received power of a DL pilot channel and the total interference strength are measured. In view of the description, this does **not appear to be sufficient** in order to establish a coverage assertion for the uplink and the downlink.

In **claims 4 and 10**, the ratio of I_{eig} to I_{fr} is established on the basis of the measured received power of the continuously transmitting pilot channels.

Observation: Does the sum of these received powers equal the measured interference strength in **claim 1**? How are these interference strengths, I_{eig} and I_{fr} , determined? Although equation (13) in the description also appears to disclose the establishment of such a ratio, it does not appear to be essential to solving the problem to be solved by the invention.

B. Novelty and inventive step, PCT Article 33

Preliminary observation:

Pursuant to PCT Rule 70.2 (c), the reasoned statement with respect to **novelty, inventive**

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step and industrial applicability has been established on the basis of the originally submitted **claims 1-8**.

1. First group:

1.1 Originally submitted independent **claim 1**:

1.1.1 With respect to the originally submitted independent **claim 1**, D1 discloses a "method for analyzing the interference and coverage situation in UMTS sub-networks" with the following features of the originally submitted **claim 1**:

- recording measured data within predetermined surface elements of a restricted area (D1, page 8, lines 17-20)
- measuring the received power of at least one downlink pilot channel of several receivable base stations in said surface element as well as the total interference strength in the relevant frequency band within each surface element (D1, page 10, line 19 to page 12, line 7; figure 3: "315"... "330").

1.1.2 The subject matter of the originally submitted independent **claim 1** of the present application differs from the disclosure in D1 only by the following features:

The originally submitted **claim 1** explicitly

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Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

sets out the establishment of an interference matrix using the recorded measured data in order to reproduce an assertion about the interference relationship of each base station in relation to other base stations.

D1 does not appear to disclose any such interference matrix. In D1, only "rankings" of the various base stations are established on the basis of their Ec/Io value.

Therefore, the originally submitted **claim 1** meets the requirements of PCT Article 33(2) with respect to **novelty**.

1.1.3 A person skilled in the art proceeding from the closest prior art (D1) is confronted with the technical problem of visualizing the interference situation between different base stations in as correct and clear a manner as possible.

1.1.4 A person skilled in the art consulting the prior art would come upon D2, *inter alia*, which discloses that it can be advantageous to use matrices to represent the interference situations. In this context, reference is made to D2, page 4, lines 36-52; page 5, lines 54-60 and figure 1.

Therefore, D2 discloses the feature that was additionally defined in the originally

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citations and explanations supporting such statement

submitted **claim 1**.

1.1.5 Proceeding from the method defined in **D1** and with knowledge of the disclosure in **D2**, it would be obvious for the above-mentioned reasons for a person skilled in the art to apply the teaching in **D2** to the method known from **D1** and thereby to arrive at a method according to the subject matter of the originally submitted **claim 1**.

1.1.6 The method defined in the originally submitted independent **claim 1** cannot be acknowledged as involving an **inventive step** for the reasons indicated. Therefore, the originally submitted independent **claim 1** does not meet the requirements of PCT Article 33(3).

1.2 Originally submitted **claim 3**:

1.2.1 Furthermore, the originally submitted dependent **claim 3** makes **no inventive contribution** (PCT Article 33(3)) to the originally submitted **claim 1**, to which it refers, since the feature contained in the originally submitted **claim 3** is regarded as an obvious feature without any essential significance.

2. Second group:

2.1 Originally submitted **claims 2 and 4**:

2.1.1 **D3**, which is cited above, appears to disclose

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Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

or render obvious all of the features of the originally submitted independent **claims 2 and 4**.

Reference is made to *D3*, pages 322 and 323, sections "*C1. Uplink Iteration Step*" and "*C2. Downlink Iteration Step*", and figures 2 and 3. *D3* describes a method for the separate determination of the uplink and downlink coverage situation of a WCDMA system. The "received power of at least one DL pilot channel from several...receivable base stations" and the "interference strength" are determined (*D3*, page 323, figure 3, "*calculate CPICH E_c/I_o for all MSs*", "*calculate the C/I for each MS*"); the "ratio of the received power of the observed cell to the received power of all of the foreign cells is calculated" (*D3*, page 323, figure 3, "*calculate new $I=I_{oth}/I_{own}$* ") and "an assertion is developed about the coverage situation in the uplink and downlink" (*D3*, page 325, left-hand column, lines 5-29).

2.1.2 For this reason, the originally submitted independent **claims 2 and 4** do not meet the requirements of PCT Article 33(2) and (3).

2.2 Originally submitted **claims 3 and 5-8**:

2.2.1 Furthermore, the originally submitted dependent **claims 3 and 5-8** make no inventive **contribution** (PCT Article 33(3)) to the

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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claims to which they refer, since the features contained therein are either disclosed in D3, can be derived directly therefrom, or are obvious features without any essential significance:

- (a) Originally submitted **claims 3 and 5**:
obvious features without any essential significance
- (b) Originally submitted **claims 6 and 8**:
D3, page 322, left-hand column, lines 26-31, "...each of the users can have different terminal speed and uses a different service...therefore each mobile station gets assigned an individual E_b/N_o requirement..."; page 323, left-hand column, lines 24-25, "...where E_bN_{oMS} is the received E_b/N_o requirement of the MS depending on terminal speed and service..."
- (c) Originally submitted **claim 7**:
D3, page 323, left-hand column, equation (18); Note: "R" corresponds to the useful data rate.

2.2.2 Therefore, the originally submitted **claims 3 and 5-8** do not meet the requirements of PCT Article 33(3).

C. **Certain defects in the international application**

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

1. Figures 5 and 6 clearly do not meet the requirements of PCT Rule 11.2(a) ("Physical Requirements of the International Application"/"Fitness for Reproduction") or of PCT Rule 11.13(a) ("Special Requirements for Drawings").

An objection is raised with respect to figures 5 and 6 because it appears that the information content, i.e. the areas of the coverage zone having the corresponding level, can be assessed only through the color codes used therein. This is inadmissible pursuant to PCT Rule 11.13(a).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Box I**Basis of the report**

1. The amendments submitted with the letter of 8 August 2005 introduce substantive matter which, contrary to PCT Article 34(2)(b), goes beyond the disclosure of the international application as filed.

The amendments are the following:

1.1 Claim 2:

The new **claim 2** was established by changing the wording relating to the subject matter of the original independent **claim 2** so as to render it dependent on the original independent **claim 1**. This has resulted in a combined method wherein an assertion about the interference relationship between base stations is established by means of an interference matrix and an assertion about the coverage situation (radio coverage) is established in the uplink and downlink.

Furthermore, in this combined method (**claims 1, 2 and 4**), the received power of at least one downlink pilot channel and the received power of the continuously transmitting pilot channels are defined.

Supplemental Box

The originally submitted documents do not disclose this type of combined method (claims 1, 2, and 4) involving the above-mentioned steps.

1.3 Claims 2, 4, and 6-8:

In claims 2, 4 and 6-8, the term "coverage situation" was replaced by the term "radio coverage".

Although these terms could be considered equivalent, uncertainties arise owing to the fact that the expression "coverage situation" is still used in the preamble of independent claim 1, which, for this reason, results in different possibilities for the interpretation of said claim:

1.3.1 The term "radio coverage" used in claims 2, 4, and 6-8 could refer to and represent the term "coverage situation", which would not contravene PCT Article 34(2) (b).

1.3.2 The term "radio coverage" used in claims 2, 4, and 6-8 could, however, also have a different meaning, and this would **contravene** PCT Article 34(2) (b).

1.4 Claims 9, 10 and 12-14:

The term "coverage situation" is also used in addition to the term "radio coverage" in claims 9, 10 and 12-14. Therefore, the same

Supplemental Box

possibilities for interpretation (as those presented in point 1.3) lead to the same problems with respect to the requirements of PCT Article 34(2) (b) .

1.5 **Claim 10:**

The new **claim 10** was established by changing the wording relating to the subject matter of the original independent **claim 4** so as to render it dependent on the original independent **claim 2** (restricted by the original dependent **claim 3**) .

This results in a combined method wherein the received power of at least one downlink pilot channel and the received power of the continuously transmitting pilot channels are defined.

The originally submitted documents do not disclose a combined method of this type comprising the above-mentioned steps.

2. The PCT Regulations set out the following in PCT Rule 70.2(c):

"If the International Preliminary Examining Authority considers that any amendment goes beyond the disclosure in the international application as filed, **the report shall be established as if such amendment had not been made, and the report shall so indicate.** It shall also

Supplemental Box

indicate the reasons why it considers that the amendment goes beyond the said disclosure."

Therefore, on the basis of PCT Rule 70.2(c), the reasoned statement in Box V with respect to **novelty, inventive step and industrial applicability** does not have to establish a report for the **claims 1-14** submitted with the letter of 8 August 2005.

Therefore, the statements in Box V form the basis for the originally submitted **claims 1-8**.

Supplemental Box

Box IV**Lack of unity of invention**

1. Reasons for the **lack of unity** (PCT Rule 13.1 and 13.2):

1.1 The subjects of the following groups of inventions -only the independent claims have been included in these groups- are not so linked as to form a single general inventive concept:

(a) Group 1: independent **claim 1**

(b) Group 2: independent **claim 9**

The reasons therefore are the following:

1.2 The search resulted in the following prior art relevant to the assessment of the unity of invention:

D1: WO-A-01/45284 (see "Cited documents" above)

D1 explicitly discloses the recording of measured data within predetermined surface elements of a restricted area, the received power of the receivable downlink pilot channels and the total interference strength being measured. Reference is made to the passages in the international search report.

Supplemental Box

Consequently, these features, which are the same as those in independent **claims 1 and 9**, cannot be regarded as **special technical features** under PCT Rule 13.2.

- 1.3 A comparison of said groups of inventions to **D1** shows that the following features shall be regarded as **special technical features** under PCT Rule 13.2.

The special technical features of independent **claim 1** relate to the reproduction of an assertion about the interference relationship between various base stations by means of an interference matrix.

The special technical features of independent **claim 9** relate to developing an assertion about the coverage situation in the uplink and downlink.

- 1.4 Therefore, the requisite **unity** of invention (PCT Rule 13.1) is not established, since there is no technical relationship between independent **claim 1** and independent **claim 9** within the meaning of PCT Rule 13.2 involving one or more of the same or corresponding **special technical features**.

- 1.5 Contrary to the applicant's assumption, a complete international search report encompassing all of the inventions was indeed

Supplemental Box

established after an additional search fee was paid for the second group of inventions. The written report by the International Searching Authority also contains a position with respect to all of the inventions.